REMARKS

The final Office Action of June 19, 2002 has been carefully reviewed and this paper is responsive thereto. The Applicants respectfully request reconsideration of the Application in view of the foregoing Amendments and the following Remarks. In that Examiner's action, claims 1-16, 18, 19, and 21-39 were rejected under 35 U.S.C. § 103(a), and claims 17 and 20 allowed. By this response, the Applicants have amended claims 1, 29, and 30. No new matter has been introduced into the application. The claims are believed to be in allowable condition. The Applicants respectfully request reconsideration of the application, withdrawal of the rejections of the claims and allowance of all pending claims.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

Rejection Under 35 U.S.C. § 103(a)

Claims 1-16, 18, 19, 21-24, 29, 30-34, and 35 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,344,431 ("Merritt") in view of U.S. Patent No. 6,167,309 ("Lyden"). The Applicants traverse the rejection in view of the above amendments and the following Remarks.

As discussed in Applicants' prior response, Merritt discloses a method and apparatus for determination of battery end-of-service in a medical device. (Abstract). Upon receipt of the battery voltage and battery uplink data, the programmer may report expected time to end of service by comparing the battery voltage to the voltage value shown in Fig. 2. A percentage capacity remaining is determined and with the uplinked battery current data value, the time to recommended replacement (Time RR) may be calculated. (col. 9, lines 50-57). Battery current may be determined by any number of techniques, for example, by sampling voltage across a small resistor connected between the battery and pacemaker circuit. (col. 9, lines 44-49).

Similarly, Lyden discloses a system that allows for estimation of the estimated replacement time for the battery. This is performed generally by determining a rate of charge in a storage capacitor during a quiescent period and correlating the rate of charging to a value of the internal resistance. (Abstract). This internal resistance may then be correlated to the present battery charge depletion state. (Col. 7, lines 53-59). Once the present battery charge depletion is determined, Elective Replacement Times and/or End of Life Times may be determined. Significantly, this is done by '[g]raphical or mathematical relationships [that are] pre-established based upon, for example, known battery characteristics, known power requirements for specific devices, specific programming imposed upon the device, and known history of the device user." (Col. 7, lines 59-63) (emphasis added).

The present invention, on the other hand, discloses a method and apparatus that more accurately estimates the remaining life of the battery. In particular, the present invention discloses at least two methods by which the remaining life is estimated. In one embodiment, the remaining capacity is multiplied by the ratio of actual used capacity to the actual time the IPG has been working. In another embodiment, the remaining capacity is multiplied by the ratio of actual used capacity since the IPG was last reprogrammed to the actual time the IGP has been working since the IPG was last reprogrammed.

As discussed in Applicants' prior response and as acknowledged in the final Office Action, Merritt, fails to disclose, teach, or suggest a system that takes into account actual power usage information by the user to thereby determine an average usage rate from which to extrapolate when the battery will become depleted. As described above, Lyden also fails to disclose, teach, or suggest this same feature of the claimed inventions. Lyden merely estimates end of battery life by "pre-established" graphical or mathematical relationships. In contrast, the Applicants' invention discloses a more accurate technique for determining power source life that is based on actual power usage history.

For example, with respect to independent claim 1, both Merritt and Lyden fail to disclose, teach, or suggest as least the steps of "obtaining a used capacity of the power source and a time that the power source has been operating, wherein the used capacity and the time are actual measurements; and determining the remaining life of the power source based on the used capacity of the power source and the time that the power source has been operating." Each of the other independent claims recites similar limitations. The dependent claims, which depend from and further limit the amended independent claims, are patentably distinct over Merritt for at least the same reasons. The Applicants therefore respectfully request withdrawal of this ground for rejection of claims 1-16, 18, 19, 21-24, 29, 30-34, and 35.

The other rejected claims (claims 25-28 and 36-39) stand rejected based upon the combination of Merritt and Lyden and further in view of one or more other references. In view of the foregoing Amendments and Remarks, the Applicants respectfully submit that these claims are patentably distinct for at least the same reasons. Moreover, the Applicants submit that the final Office Action fails to establish a *prima facie* case that the references are properly combinable in such a manner as to render unpatentable claims 25-28 and 36-39. The Applicants therefore respectfully request withdrawal of this ground for rejection of claims 25-28 and 36-39.

CONCLUSION

All rejections having been addressed, the Applicants respectfully submit that the instant application is in condition for allowance, and respectfully solicit prompt notification of the same. Should the Examiner have any questions, the Examiner is invited to contact the undersigned at the number set forth below.

Respectfully submitted,

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Dated: December 18, 2002

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"Version With Markings To Show Changes Made"

IN THE CLAIMS

Claims 1, 29 and 30 have been amended as follows:

1. (**Twice Amended**) A method of determining the current status and remaining life of a power source in an implantable neurological tissue stimulator comprising the steps of:

assessing the power source voltage of the power source in an implantable neurological tissue stimulator;

determining, based on the assessed power source voltage, where the power source is in its power source life cycle;

obtaining a used capacity of the power source and a time that the power source has been operating, wherein the used capacity and the time are actual measurements; and

determining the remaining life of the power source based on the used capacity of the power source and the time that the power source has been operating.

29. (**Twice Amended**) A method of determining the current status and remaining life of a power source in an implantable neurological tissue stimulator comprising the steps of:

assessing the voltage of the power source in an implantable neurological tissue stimulator;

determining, based on the assessed voltage of the power source, where the power source is in its life cycle;

obtaining a used capacity of the power source and a time that the power source has been operating, wherein the used capacity and the time are actual measurements; and

determining the remaining life of the power source based on the used capacity of the power source and the time that the power source has been operating.

30. (**Twice Amended**) A device for determining the current status and remaining life of a power source in an implantable neurological tissue stimulator~~,~~ device comprising:

an implantable neurological tissue stimulator, the implantable neurological tissue, stimulator having:

a source of power;

a voltage determining system for determining the voltage of the source of power;

a programmer for creating and processing information to be sent to and received from the implantable neurological tissue stimulator, the programmer including a processor and a memory attached thereto;

a system for communicating information between the implantable neurological tissue stimulator and the programmer;

wherein the voltage determining system for determining the voltage of the source of power passes the determined voltage of the source of power to the system for communication; and

wherein the system for communication passes the determined voltage of the source of power from the implantable neurological tissue stimulator to the programmer and to the processor, and

wherein the processor determines, based on the determined voltage of the source of power, where the source of power is in its life cycle; obtains a used capacity of the power source and a time that the power source has been operating, wherein the used capacity and the time are actual measurements; and determines the remaining life of the power source based on the used capacity of the power source and the time that the power source has been operating.